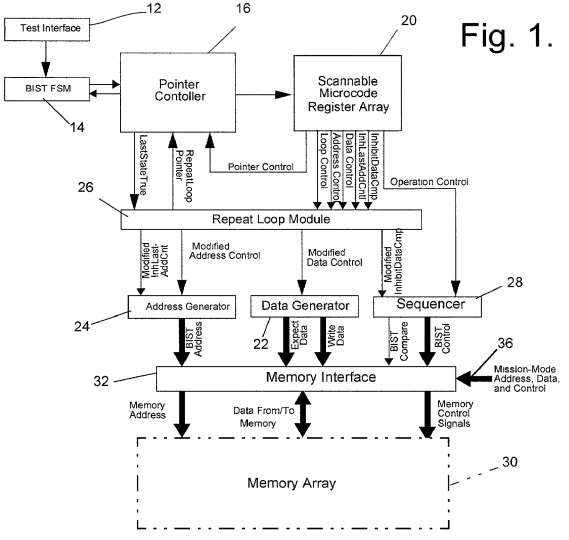

Fig. 1.

10/23/03 "EXPRESS MAIL" EV 339850760

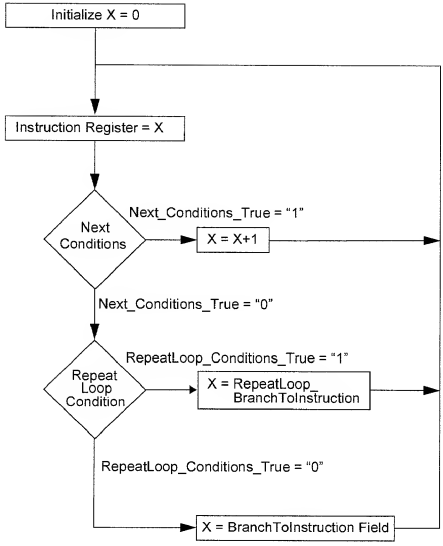
Initialize X = 0
Instruction Register = X
Next Conditions
Next_Conditions_True = "1"
X = X+1
Next_Conditions_True = "0"
Repeat Loop Condition
RepeatLoop_Conditions_True = "1"
X = RepeatLoop_ BranchToInstruction
RepeatLoop_Conditions_True = "0"
X = BranchToInstruction Field

Fig. 2.

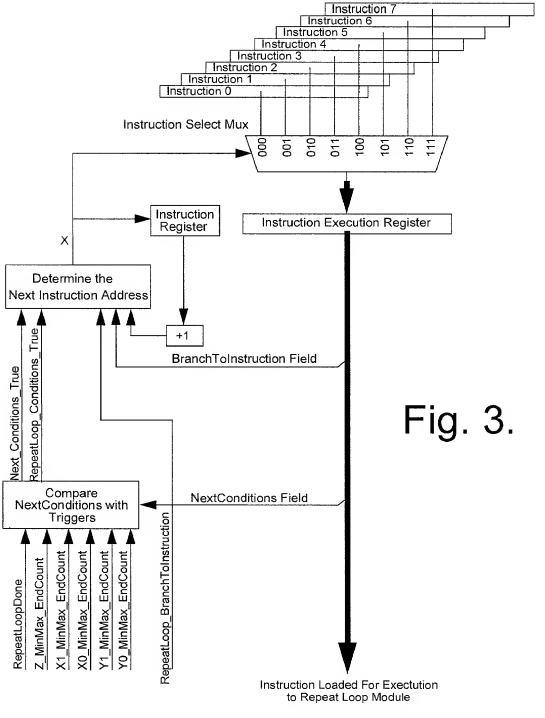
Instruction 7
Instruction 6
Instruction 5
Instruction 4
Instruction 3
Instruction 2
Instruction 1
Instruction 0
Instruction Select Mux
000
001
010
011
100
101
110
111
Instruction Register
Instruction Execution Register
X
Determine the Next Instruction Address
+1
BranchToInstruction Field
Next_Conditions_True
RepeatLoop_Conditions_True
Compare NextConditions with Triggers
NextConditions Field
RepeatLoopDone
Z_MinMax_EndCount
X1_MinMax_EndCount
X0_MinMax_EndCount
Y1_MinMax_EndCount
Y0_MinMax_EndCount
RepeatLoop_BranchToInstruction
Instruction Loaded For Exectution to Repeat Loop Module

Fig. 3.

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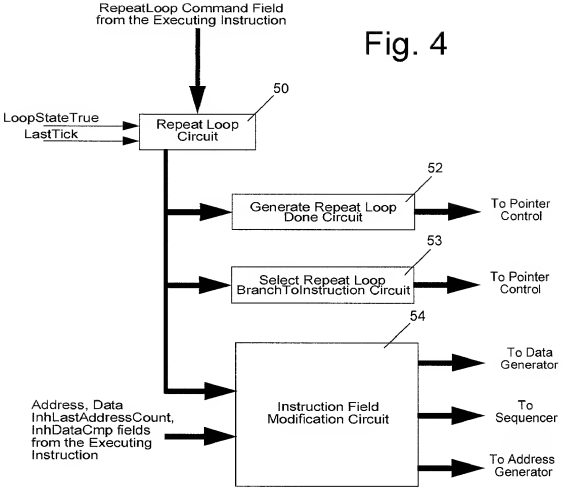
Fig. 4



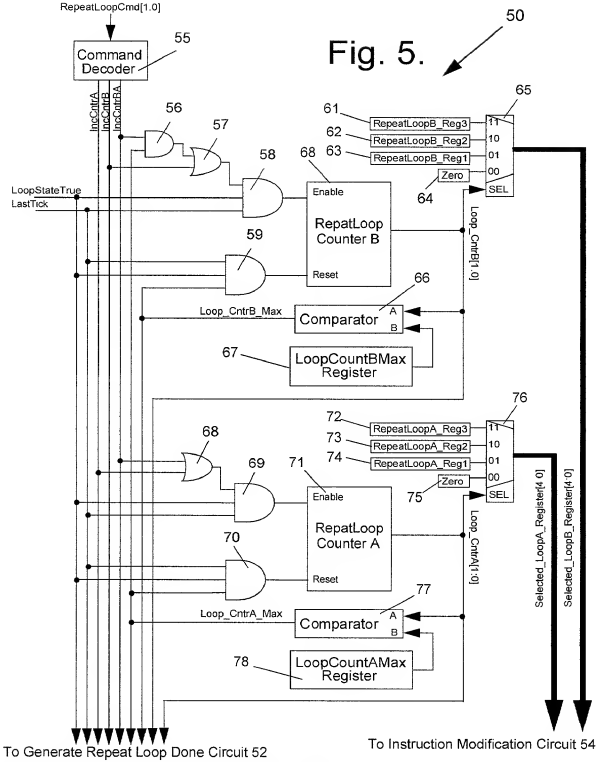

RepeatLoopCmd[1.0]
Command Decoder
55
50
Fig. 5.
IncCntrA
IncCntrB
IncCntrBA
56
57
58
LoopStateTrue
LastTick
59
61
62
63
RepeatLoopB_Reg3
RepeatLoopB_Reg2
RepeatLoopB_Reg1
Zero
11
10
01
00
SEL
65
64
68
Enable
RepatLoop Counter B
Reset
Loop_CntrB[1.0]
66
Loop_CntrB_Max
Comparator
A
B
67
LoopCountBMax Register
76
72
73
74
RepeatLoopA_Reg3
RepeatLoopA_Reg2
RepeatLoopA_Reg1
Zero
11
10
01
00
SEL
75
68
69
71
Enable
RepatLoop Counter A
Reset
Loop_CntrA[1.0]
70
77
Loop_CntrA_Max
Comparator
A
B
78
LoopCountAMax Register
Selected_LoopA_Register[4.0]
Selected_LoopB_Register[4.0]
To Instruction Modification Circuit 54
To Generate Repeat Loop Done Circuit 52
To Select Repeat Loop BranchToInstructioin Circuit 53
To Instruction Modification Circuit 54

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Fig. 6.

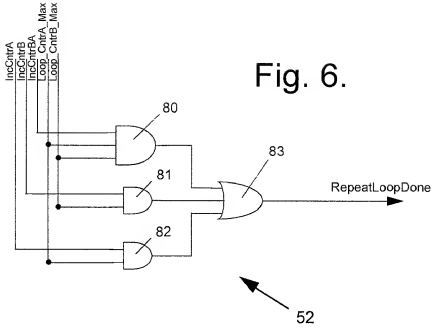

Fig. 7.

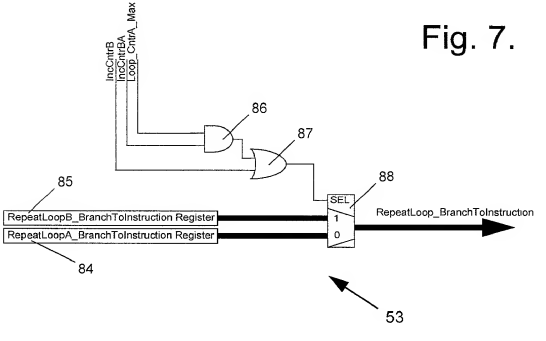

Fig. 8.

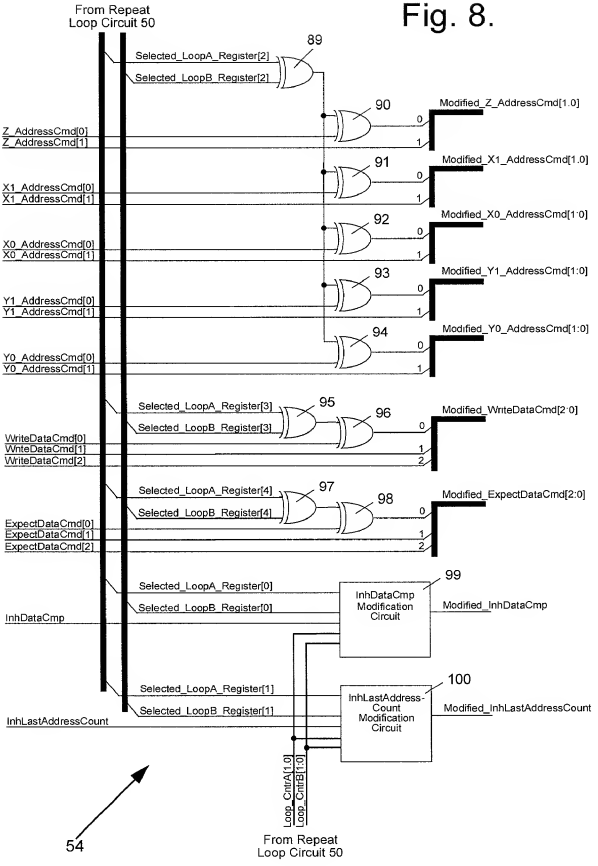
From Repeat Loop Circuit 50
89
Selected_LoopA_Register[2]
Selected_LoopB_Register[2]
90
Z_AddressCmd[0]
Z_AddressCmd[1]
Modified_Z_AddressCmd[1.0]
91
X1_AddressCmd[0]
X1_AddressCmd[1]
Modified_X1_AddressCmd[1.0]
92
X0_AddressCmd[0]
X0_AddressCmd[1]
Modified_X0_AddressCmd[1:0]
93
Y1_AddressCmd[0]
Y1_AddressCmd[1]
Modified_Y1_AddressCmd[1:0]
94
Y0_AddressCmd[0]
Y0_AddressCmd[1]
Modified_Y0_AddressCmd[1:0]
Selected_LoopA_Register[3]
Selected_LoopB_Register[3]
95
96
WriteDataCmd[0]
WriteDataCmd[1]
WriteDataCmd[2]
Modified_WriteDataCmd[2:0]
Selected_LoopA_Register[4]
Selected_LoopB_Register[4]
97
98
ExpectDataCmd[0]
ExpectDataCmd[1]
ExpectDataCmd[2]
Modified_ExpectDataCmd[2:0]
Selected_LoopA_Register[0]
Selected_LoopB_Register[0]
99
InhDataCmp Modification Circuit
InhDataCmp
Modified_InhDataCmp
Selected_LoopA_Register[1]
Selected_LoopB_Register[1]
100
InhLastAddress-Count Modification Circuit
InhLastAddressCount
Modified_InhLastAddressCount
Loop_CntrA[1:0]
Loop_CntrB[1:0]
54
From Repeat Loop Circuit 50

Fig. 9.

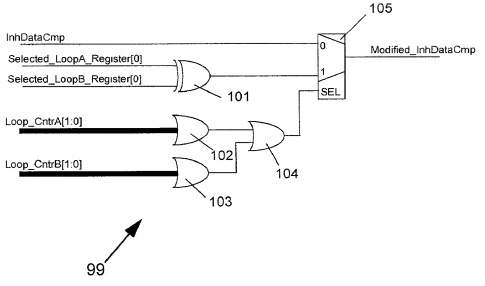

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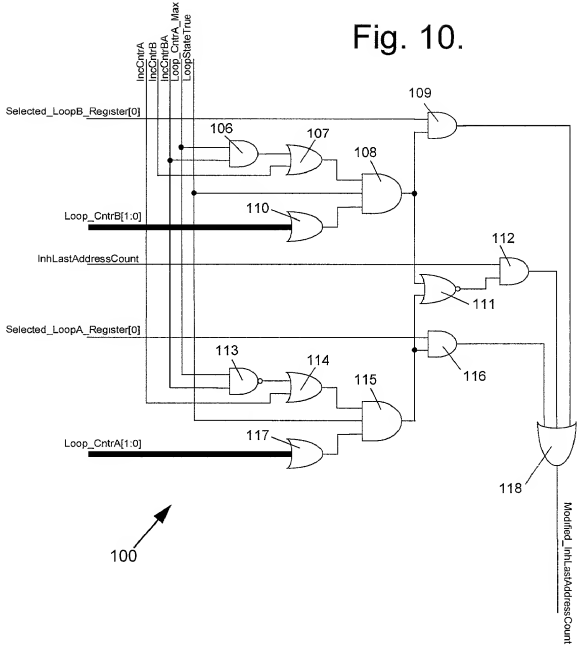
Fig. 10.



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